

### REMARKS/ARGUMENTS

Upon entry of the foregoing amendments, claims 69-89 will be pending in this patent application. Claims 69-71, 73, and 75-80 have been amended. Claims 72 and 74 have been canceled. Claims 82-89 have been added. Support for the foregoing amendments can be found throughout Applicants' specification including, for example, at page 7, line 17 to page 11, line 28. No new matter has been added.

In view of the following remarks, reconsideration and withdrawal of the rejections is respectfully requested.

#### **Obviousness-Type Double Patenting**

Claims 69-82 have all been rejected under the judicially created doctrine of obvious-type double patenting over claims 1-58 of U.S. Patent No. 5,021,515, claims 1-11 of U.S. Patent No. 5,049,624, and claims 1-8 of U.S. Patent No. 5,955,527. Applicants request that this rejection be deferred pending some identification of allowable subject matter, as it likely can be readily resolved (depending upon the subject matter ultimately allowed) through the filing of a suitable terminal disclaimer.

#### **Rejections Under 35 U.S.C. § 102(b)**

Claims 69-77 and 80-82 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 4,206,100 to Kyo et al. ("the Kyo patent"). Applicants respectfully traverse this rejection as the Kyo patent falls far short of teaching or suggesting the composition recited in Applicants' claims.

Applicants' claims recite an oxygen-scavenging composition comprising a non-oxidizable polyester component, a polymeric organic oxidizable component, and a transition metal in the positive oxidation state that promotes the oxidation of the organic oxidizable

component such that, when incorporated into the wall of a monolayer package, the wall achieves an oxygen permeance that is lower relative to the wall without the oxygen-scavenging composition. Significantly, the lower permeance is the result of the transition metal promoting the oxidation of the polymeric organic oxidizable component.

The Kyo patent discloses engineering plastic compositions with improved mechanical characteristics. The Kyo patent does not teach or suggest to one skilled in the art that the disclosed engineering plastics are oxygen-scavenging compositions, let alone compositions that comprise a polymeric organic oxidizable component as recited by Applicants' claims. The Office Action appears to base its § 102(b) rejection upon the Kyo patent's teaching of a composition that comprises "a polyester, polyamide and metal compound."<sup>1</sup> There is nothing in the Kyo patent, however, to teach or suggest to one skilled in the art that the Kyo patent discloses an oxygen-scavenging composition, let alone an oxygen-scavenging composition that, if incorporated into a monolayer wall, would achieve a lower permeance as a result of the transition metal promoting the oxidation of the polymeric organic oxidizable component. As explained below, it would be counter-intuitive to read the Kyo patent as teaching or suggesting compositions that react with, *i.e.*, scavenge oxygen.

Applicants' specification teaches that "oxygen-scavenging implies consumption of a material incorporated in the wall of a container" that will be "progressively consumed" upon reaction with oxygen (page 3, lines 1-4). In contrast, the Kyo patent teaches engineering plastic compositions having *improved mechanical strength*. Significantly, one skilled in the

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<sup>1</sup> The Office Action appears to be unduly narrowly construing the claim limitation "polymeric organic oxidizable component" to be limited to a "polyamide." Indeed, Applicants respectfully submit that such construction is unwarranted by Applicants' specification. In this regard, while Applicants' specification teaches oxidizable polymers generally, and teaches that polyamides are "[p]articularly interesting oxidizable polymers" (page 15, line 17-18), one skilled in art could readily identify which other polymers are oxidizable and, thus, given the teaching of the instant specification, would understand how to make a wall for a package that scavenged oxygen.

art would recognize that the compositions disclosed by the Kyo patent are characteristic of compositions that do ***not oxidize*** and, thus, maintain their strength. In this regard, the Kyo patent, at col. 7, lines 25-31, teaches that:

[i]f copper compounds are incorporated in the resin composition of this invention, not only are the ***mechanical characteristics of a molded article, especially impact strength of brittleness at thin-walled portion, improved*** but coloration due to exposure of the article to high temperature is prevented accompanied by ***noticeably improved durability of the mechanical characteristics.***

(emphasis supplied). Similarly, at col. 8, lines 5-15, the Kyo patent teaches:

It has also been found by the present inventors that using at least about 10 parts by weight based on 100 parts by weight of the sum of (A) PPES and (B) PA, especially at least 15 parts by weight of titanium dioxide provides interesting effects not only of ***improving the mechanical characteristics*** of a resin composition comprising PPES and PA but of ***correcting satisfactorily the nature of the resin composition so that it may not turn yellow upon exposure to ultraviolet rays*** as well as of significantly increasing the heat distortion temperature of the resin composition.

(emphasis supplied). Indeed, improving the mechanical strength of a composition and preventing deterioration in a polymer's coloration due to exposure to light and heat is an indication that the polymer ***is not being oxidized***. Thus, the Kyo patent teaches that its compositions are ***resistant*** to oxidation, *i.e.*, reacting with oxygen, and, accordingly, are ***not oxygen-scavenging*** compositions. Accordingly, the Kyo patent does not teach or suggest the composition recited in Applicants' claims.

Claims 69-77 and 80-82 have also been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 3,260,689 to Kibler et al. ("the Kibler patent"). Applicants respectfully traverse this rejection as the Kibler patent falls far short of teaching or suggesting the composition recited in Applicants' claims.

Applicants' claims recite an oxygen-scavenging composition comprising a non-oxidizable polyester component, a polymeric organic oxidizable component, and a transition metal in the positive oxidation state that promotes the oxidation of the organic oxidizable component such that, when incorporated into the wall of a monolayer package, the wall achieves an oxygen permeance that is lower relative to the wall without the oxygen-scavenging composition. Significantly, the lower permeance is the result of the transition metal promoting the oxidation of the polymeric organic oxidizable component.

The Kibler patent, in contrast, *separately* discloses polyesters and polyamides compositions that have improved dyeing properties. In other words, the Kibler patent only discloses *two component compositions* – either a polyester and a metal or a polyamide and a metal. Nowhere does the Kibler patent teach or suggest a composition comprising a non-oxidizable polyester component *and* a polymeric organic oxidizable component – whether that polymeric organic oxidizable component is a polyamide or other polymeric organic oxidizable component. Applicants' claims, in contrast, recite *three components*: a non-oxidizable polyester component, a polymeric organic oxidizable component, and a transition metal in the positive oxidation state. Accordingly, the Kibler patent does not teach or suggest the composition recited in Applicants' claims.

Claims 69-77 and 80-82 have also been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 4,038,228 to Taylor et al. ("the Taylor patent"). Applicants respectfully traverse this rejection as the Taylor patent falls far short of teaching or suggesting the composition recited in Applicants' claims.

Applicants' claims recite an oxygen-scavenging composition comprising a *non-oxidizable polyester component*, a polymeric organic oxidizable component, and a transition

metal in the positive oxidation state that promotes the oxidation of the organic oxidizable component such that, when incorporated into the wall of a monolayer package, the wall achieves an oxygen permeance that is lower relative to the wall without the oxygen-scavenging composition. Significantly, the lower permeance is the result of the transition metal promoting the oxidation of the polymeric organic oxidizable component. In this regard, the oxygen scavenging occurs as only *one* component of the composition – the polymeric organic oxidizable component – is oxidized, while the *non-oxidizable polyester component* remains un-oxidized to function as a passive barrier to oxygen.

The Taylor patent, in contrast, discloses a degradable plastic composition consisting of an organic polymer and a transition metal derivative of at least one highly unsaturated organic acid. Unlike the subject matter in Applicants' claims, the Taylor patent teaches that the *whole container* degrades.<sup>2</sup> As such, the Taylor patent does not teach or suggest a *non-oxidizable polyester* component. Significantly, the Taylor patent, at column 2, lines 13-33, provides a disclosure of the "contemplated" organic polymers that would degrade according to the alleged invention. Notably, polyesters are *absent* from the list.

Moreover, Applicants' claims recite three components: a non-oxidizable polyester component, a polymeric organic oxidizable component, and a transition metal in the positive oxidation state. The Taylor patent, in contrast, only discloses *two component compositions* – an organic oxidizable polymer component (that is not a polyester) and a transition metal derivative of at least one highly unsaturated organic acid. Accordingly, the Taylor patent does not teach or suggest the composition recited in Applicants' claims.

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<sup>2</sup> Indeed, the Taylor patent teaches that significant degradation of the container occurs within 3 days (see, e.g., Example 1 at col. 4, lines 34-41).

Claims 69-77 and 80-82 have also been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by JP 55-90535. (“the JP 535 reference”). Applicants respectfully traverse this rejection as the JP 535 reference falls far short of teaching or suggesting the composition recited in Applicants’ claims.

Applicants’ claims recite an oxygen-scavenging composition comprising a non-oxidizable polyester component, a polymeric organic oxidizable component, and a transition metal in the positive oxidation state that promotes the oxidation of the organic oxidizable component such that, when incorporated into the wall of a monolayer package, the wall achieves an oxygen permeance that is lower relative to the wall without the oxygen-scavenging composition. Significantly, the lower permeance is the result of the transition metal promoting the oxidation of the polymeric organic oxidizable component.

The JP 535 reference, in contrast, does not disclose a composition comprising a non-oxidizable polyester component, a polymeric organic oxidizable component, and a transition metal in the positive oxidation state that promotes the oxidation of the organic oxidizable component. In this regard, the JP 535 reference teaches compositions comprising a “deoxidant” that includes “iron, zinc powder, FeO, sulphites, oxalate, [and] glucose” (see, Abstract of the JP 535 reference attached hereto as Tab A), none of which are *a polymeric organic oxidizable component* as recited by Applicants’ claims. Significantly, the JP 535 reference teaches that “[o]xygen gas penetrating from the outside through the wall of the vessel is absorbed by the *deoxidant*” (Id.). Thus, to the extent that the JP 535 reference teaches that a component of a wall reacts with oxygen, the reaction occurs between the *deoxidant* and oxygen, and not by the metal-promoted oxidation of the polymeric organic oxidizable component. Significantly, the deoxidants disclose by the JP 535 reference

are either metals themselves, metal oxides, sulfites, or organic compounds. Accordingly, the JP 535 reference does not teach or suggest a lower oxygen permeance that is the result of the transition metal in the positive oxidation state promoting the *oxidation of a polymeric organic oxidizable component* as is recited by Applicants' claims. Accordingly, the JP 535 reference does not teach or suggest the composition recited in Applicants' claims.

**Rejections Under 35 U.S.C. § 103(a)**

Claims 69-82 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 4,501,781 to Kushida et al. ("the Kushida patent") or U.S. Patent No. 4,728,549 to Shimizu et al. ("the Shimizu patent") in view of the JP 535 reference, and further in view of U.S. Patent No. 3,260,689 to Kibler et al. ("the Kibler patent"), the Taylor patent (above), the Kyo patent (above), U.S. Patent No. 4,237,034 to Tomka et al. ("the Tomka patent"), U.S. Patent No. 4,727,106 to Paul et al. ("the Paul patent"), and Japanese Reference JP 57-185349 ("the JP 349 reference"). Applicants respectfully traverse this rejection as one skilled in the art would not have been motivated to combine the cited references in such a way as to obtain the composition recited in Applicants' claims.

Applicants' claims recite an oxygen-scavenging composition comprising a non-oxidizable polyester component, a polymeric organic oxidizable component, and a transition metal in the positive oxidation state that promotes the oxidation of the organic oxidizable component such that, when incorporated into the wall of a monolayer package, the wall achieves an oxygen permeance that is lower relative to the wall without the oxygen-scavenging composition. Significantly, the lower permeance is the result of the transition metal promoting the oxidation of the polymeric organic oxidizable component.

The Office Action provides neither evidence nor a convincing line of reasoning to demonstrated why one skilled in the art would have been motivated to combine either of the Kushida patent or the Shimizu patent with the JP 535 reference in such a manner as to obtain the composition recited in Applicants' claims. *Ex parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. & Inter. 1985) (“[t]o support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references”); MPEP § 2142 at 2100-110. As detailed below, one of ordinary skill in the art presented with the cited references at the time the earliest priority application was filed would not have been motivated to combine either of the Kushida or Shimizu patents with JP 535 because the cited references - either alone or in combination – do not teach metal promoted oxidation of a polymeric organic oxidizable component.

The Kushida patent, for example, teaches a blow-molded bottle having three layers wherein the middle layer is a mixture of polyethylene terephthalate and MXD6 nylon, a passive gas barrier polymer. The Kushida patent does not teach that such composition comprises a transition metal in the positive oxidation state. Thus, the Kusida patent does not teach the claimed oxygen-scavenging composition.

The Shimizu patent teaches a multilayer container having separate layers of polyethylene terephthalate and MXD6 nylon. Like the Kushida patent, the Shimizu patent does not teach the presence of a transition metal in the positive oxidation state. Thus, the Shimizu patent does not teach the claimed oxygen-scavenging composition.

As detailed above, the JP 535 reference teaches compositions comprising a “deoxidant” that includes “iron, zinc powder, FeO, sulphites, oxalate, [and] glucose” (see, Abstract of the JP 535 reference attached hereto as Tab A), none of which are *a polymeric organic oxidizable component* as recited by Applicants’ claims. The JP 535 reference teaches that “[o]xygen gas penetrating from the outside through the wall of the vessel is absorbed by the *deoxidant*” (Id.). Thus, to the extent that the JP 535 reference teaches that a component of a wall reacts with oxygen, the reaction occurs between the *deoxidant* and oxygen, and not by the metal-promoted oxidation of the polymeric organic oxidizable component.

The Office Action cannot point to a single teaching in any of the cited references that would motivate one skilled in the art to combine either the Kushida or Shimizu patents with the JP 535 reference in such a way that one skilled in the art would have expected the resultant combination to scavenge oxygen through the metal promoted oxidation of a polymeric organic oxidizable component.

Moreover, even if there was motivation to make the suggested combination (which there is not), the resultant combination would not result in the composition recited in Applicants’ claims. Significantly, the deoxidants disclosed by the JP 535 reference are either metals themselves, metal oxides, sulfites, or organic compounds. As explained above, the JP 535 reference teaches that “[o]xygen gas penetrating from the outside through the wall of the vessel is absorbed by the *deoxidant*” (Id.). Thus, if the teachings of the JP reference were combined with the teaching of either of the Kushida or Shimizu patents, to the extent that any oxygen scavenging occurred, such scavenging would be the result of the deoxidant absorbing or reacting with oxygen. Accordingly, combination of the JP 535 reference with either the

Kushida or the Shimizu patents would not yield a composition that scavenges oxygen as a result of *a transition metal in the positive oxidation state promoting the oxidation of an polymeric organic oxidizable component* as is recited by Applicants' claims.

Having established that the JP 535 reference does not teach or suggest a composition that scavenges oxygen as a result of *a transition metal in the positive oxidation state promoting the oxidation of an polymeric organic oxidizable component* as is recited by Applicants' claims, the alleged motivation to combine the primary, secondary, and tertiary references becomes illusory. In this regard, the Office Action mistakenly alleges that the JP 535 reference provides the motivation to combine its teachings (and those of either the Kushida or Shimizu patents) with the cited tertiary references. Specifically, it is alleged in the Office Action that "[i]t would have been obvious to one having ordinary skill in the art, at the time the invention was made, to add the metal compounds o[f] the tertiary references, to the compositions of the primary references, since Japanese Reference [535] proves that said metal compounds improve the permeance for oxygen of the walls of their containers ..."

(Office Action at 7).

As demonstrated above, however, the JP 535 reference teaches that, to the extent that the JP 535 reference teaches that a component of a wall reacts with oxygen, the reaction occurs between the *deoxidant* and oxygen. Thus, while the 535 reference does teach that certain metal compounds may improve the permeance for oxygen of the walls of their containers, such improvement is *not* the result of the metal-promoted oxidation of the polymeric organic oxidizable component as is recited by Applicants' claims. Thus, the JP 535 reference is *insufficient* to provide the requisite art-suggested motivation to combine its teachings (and those of either of the Kushida or Shimizu patents) with any of the tertiary


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references. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are respectfully requested.

The foregoing is submitted as a full and complete response to the office action mailed on June 27, 2002, and the allowance of all claims is respectfully requested. If there are any issue that can be resolved by a telephone conference or an Examiner's amendment, the Examiner is invited to call the undersigned attorney at (215) 564-8948.

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